

# MARINE RECREATIONAL INFORMATION PROGRAM

## **FY Project Plan**

**Pilot surveys at unsampled ports and shoreline to calibrate adjustment factors in the expansion of catch, effort and CPUE from the existing creel survey in Guam**

**Created on**

**Joshua DeMello**

# **1. Overview**

## **1.1. Background**

The creel surveys being conducted in American Samoa, Guam and Northern Mariana Islands that aims to collect fishery dependent information are based on a stratified systematic sampling design on periods and areas representative of the different fisheries. These surveys generate catch, effort, CPUE, and species composition information based on samples from a subset of sampling frame. These subsamples are then expanded on a larger scale based on adjustment factors (p1 – for temporal adjustment and p2 – for spatial adjustment) from expert opinion.

The evaluation done by Bak (2012) on the sampling design and creel survey methods showed the current sampling design is not capable of generating an estimate of total island-wide catch because the sampling frames are not complete. There are some areas and periods not sufficiently covered by the existing design. Those unsampled periods (evening) and areas (military bases in Guam) are accommodated by using the p1 and p2 adjustment factors. Since the adjustment factors are based on expert opinion, they constitute unverified assumptions that may infuse unknown biases in the final estimation. One cannot generalize the level of fishing and fishery characteristics that would be represented in the samples if there is no information available to infer such generalizations. Several factors could contribute to the differences between areas covered and not covered ranging from population number, economic status, topography and accessibility of the fishing grounds etc. These have to be considered prior to any assumptions that the fishery dynamics between these areas and periods are similar.

The utility of other data sources need to be evaluated as the bases of adjustment factors for areas that are not surveyed. Guam had a long time series of aerial surveys that is not being utilized to inform the expert opinion for the spatial and temporal adjustment factors built into the expansion algorithm to estimate catches in non-surveyed areas.

These island areas have been provided exemptions to the National Saltwater Angler Registry based upon these creel surveys. In order to report accurate data on the recreational fisheries in these areas, the creel surveys need to be improved in the same fashion as the MRFSS/MRIP surveys, including the removal of bias due to private access and night fishing.

## **1.2. Project Description**

The overall goal of this project is to improve the estimation of total catch and effort from existing creel survey efforts. Non-commercial landings make up most of the shoreline fisheries in Guam and Northern Mariana Islands (Walker et al. 2012). The ratio between the commercial and non-commercial landing from the boat-based fisheries would depend on the fishing method but are generally non-commercial in nature. Estimating a total island-wide catch is important for both science (e.g. stock assessment) and management (e.g. specification of annual catch limits).

This project aims to quantify effort and catch in areas and periods not currently covered by the existing creel survey. Quantifying these parameters can provide a more informed judgment on whether these areas are significant in terms of fishery landing and whether the current landing estimates are underestimated. This project could also provide an insight on whether the current sampling areas are representative of the fisheries for Guam.

Making use of the adjustment factor feature of the catch expansion allows for estimation of total island wide catch. Informing this adjustment factors based on actual data and integrate this in the current expansion algorithm is important in order to minimize the uncertainties in terms of underestimation of the catch.

### **1.3. Objectives**

The goal of the project is provide calibration estimates to inform the adjustment factors for a more accurate estimation of total catch, effort and CPUE. The project objectives are:

1. Conduct a statistical review of alternate data (e.g. Guam aerial survey) as sources of adjustment factors for non-surveyed areas;
2. Formulate and conduct a sampling design compatible with current creel survey to cover areas and periods not addressed by the current creel surveys;
3. Collect catch, CPUE, species composition, and other meta-data associated with fishing activity;
4. Calibrate adjustment factors ( $p_1$  and  $p_2$ ) taking into account spatial/temporal coverage;

Feeding these adjustment factors with statistically valid means using actual data will significantly enhance the confidence in the data being generated by the creel surveys. This will minimize the over-reliance on expert opinion that infuses bias and subjective depending on who provides the opinion.

### **1.4. References**

Bak S. 2012. Evaluation of Creel Survey Program in the Western Pacific Region (Guam, CNMI, and American Samoa). Western Pacific Regional Fishery Management Council, Honolulu, Hawaii, USA. 96813. Pp. 59. Walker R, Ballou L, Wolfford B. 2012. Non-Commercial Coral Reef Fishery Assessments for the Western Pacific Region. Western Pacific Regional Fishery Management Council, Honolulu, Hawaii, USA. 96813. Pp. 191.

## **2. Methodology**

### **2.1. Methodology**

The project will employ an independent contract in close collaboration with the local fishery management agencies (Division of Aquatic and Wildlife Resources), US Navy base in Guam and Pacific Island Fisheries Science Center - WPacFIN. A statistical review of the Guam aerial surveys will be conducted to determine variabilities and reliability as adjustment factors for areas not covered by the current creel surveys. Expanded data will be simulated using the current adjustment factors expert opinion and will be compared to simulations based on the aerial surveys alone. Parametric or non-parametric statistics will be used to determine significant differences between the two simulations.

This project will cover areas and ports not regularly accounted for by the current creel survey. This will also cover periods that are not adequately sampled by the current survey. A survey design will be established for this independent data collection that is comparable to creel surveys (i.e. another creel survey) or a data collection system that is compatible (i.e. statistically designed opportunistic survey, observations, or community interviews) with the current collection system. The survey design will depend on the logistics involved in conducting the data collection. The critical condition is that the results should be statistically comparable with the existing creel survey design.

A team of data collectors will be hired as temporary staff under this project and will be trained in fish identification and survey protocol. This will be done in collaboration with the data collection staff of the local fishery management agencies in the respective territories. The data collection team should be versed with the species normally caught in the different fisheries. A review of the species composition list and close communication with the local data collection agents will provide good support for the getting the team up to speed.

The team will coordinate the surveys with the local data collection agents in terms of scheduling for the area-calibration study. The surveys will be conducted simultaneously to have instantaneous estimates of effort and CPUE to estimate the calibration between areas to provide an informed area adjustment factor. The temporal calibration study will be in relation to the schedule of the local data collection team. If the team is scheduled to cover periods between 5 am to 10 pm then the contractual team will cover 11pm to 4 am the following day at the same route/ports the local team covered previously.

The survey will be conducted regularly spanning for a whole year to capture the seasonality in catch landings and changes in species composition. All data will be inputted into the WPacFIN database to ensure that the data is treated similarly but will be separated from the data gathered by the local data collectors. The data gathered by the contract team will be compared against the data gathered local data collectors. Calibration ratios for each parameter (catch, effort, CPUE) would be determined for every fishing method - species/species group combination. The

adjustment factors will not be used in determining the calibration ratios. These calibration ratios will be used to inform the adjustment factors.

Once the adjustment factors have been calibrated, the time series of catch, effort and CPUE will be simulated using the calibrated and non-calibrated (expert opinion) adjustment factors. This would determine how accurate the expert opinion is in adjusting for areas not covered by the survey.

## **2.2. Regions**

## **2.3. Geographic Coverage**

Island of Guam

## **2.4. Temporal Coverage**

Data collection will run for one year and stat analysis will continue for another 6 months

## **2.5. Frequency**

Data collected weekly as in accordance with existing creel survey design

## **2.6. Unit of Analysis**

Spatial unit of analysis – island scale (Guam)

## **2.7. Collection Mode**

Using creel survey

### **3. Communications Plan**

#### **3.1. Internal**

The project team will be updated on the status of the project by the contractor on a monthly basis. The contractor will submit a progress report at the end of each month. The project team will be on conference call to discuss the progress of the project on a bi-monthly basis.

#### **3.2. External**

The Project team will be submitting monthly progress report on a standardized template. This report will be based on the report submitted by the contractor to the project team.

## **4. Assumptions and Constraints**

### **4.1. New Data**

Yes

### **4.2. Track Costs**

### **4.3. Funding Vehicle**

Existing Administrative Cooperative Agreement between NMFS PIRO and WPRFMC

### **4.4. Data Resources**

none

### **4.5. Other Resources**

Completion of the project will be dependent upon existing data collected through surveys conducted by DAWR and archived/summarized by WPacFIN for comparison with the results of this project.

### **4.6. Regulations**

Success of the project will be dependent upon the Department of Defense providing regular access for surveyors.

### **4.7. Other**

# 5. Risk

## 5.1. Project Risk

Table 1: Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
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## **6. Final Deliverables**

### **6.1. Additional Reports**

### **6.2. New Data Sets**

### **6.3. New Systems**

# 7. Project Leadership

## 7.1. Project Leader and Members

Table 2: Project Members

Project Role	Name	Organization	Title
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## 8. Project Estimates

### 8.1. Project Schedule

Table 3: Project Schedule - Major Tasks and Milestones

#	Schedule Description	Planned Start	Planned Finish	Prerequisites	Milestones
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### 8.2. Cost Estimates

Table 4: Cost Estimates

Project Need	Cost Description	Date Needed	Estimated Cost
TOTAL			\$0.00